

CLAIMS

What is claimed is:

1. A solar energy collector comprising
 - a transparent or translucent top plate
 - a bottom plate
 - a series of fluid permeable supports to space the top and bottom plates apart and to support the top plate
 - a porous absorber material for converting solar energy to thermal energy, said absorber being arranged alternately above and below said fluid permeable supports, and
 - two side closure members which cooperate with the top and bottom plates to form a fluid flow chamber wherein fluid flows through the absorber and the fluid permeable supports to remove the heat from the absorber and the supports.
2. The collector of claim 1 wherein the top plate is corrugated.
3. The collector of claim 1 wherein the top and bottom plates are corrugated.
4. The collector of claim 1 wherein the absorber is a polymer material.
5. The collector of claim 4 wherein the polymer material comprises a fabric.

6. The collector of claim 1 wherein the fluid permeable support comprises a spiral coil.
7. The collector as in claim 6 wherein the coil comprises a polymer material.
8. The collector of claim 1 wherein the closure member comprises a channel formed from a polymer material.
9. The collector of claim 1 further including support clips to attach the plates to a support structure to accommodate thermal expansion.
10. The collector of claim 1 wherein the bottom plate is an existing planar structure upon which the other components are placed.
11. The collector of claim 1 wherein the bottom plate is an existing corrugated structure and upon which the other components are placed to form a new solar collector system including said corrugated structure.
12. The collector in claim 1 where the fluid is air.
13. The collector as in claim 1 wherein the tilt angle of the absorber material is adjustable within the collector.

14. The collector as in claim 13 wherein the tilt angle is adjusted by varying the size of the fluid permeable supports.
15. The collector as in claim 1 further including restraining clips to connect at least portions of an edge of the collector to a support wherein the restraining clips provide vertical restraint but permit horizontal movement.
16. A solar energy collector comprising:
- a transparent or translucent top plate,
 - a series of heat absorbing fluid permeable supports provided at intervals below the top plate and a lower surface to which the supports are affixed
 - a porous absorber material for converting solar energy to thermal energy, said absorber extending between said fluid permeable supports, and
 - two side closure members which cooperate with the top plate and the lower surface to form a fluid flow chamber there between wherein fluid flows through the absorber and the fluid permeable supports to remove the heat from the absorber and the fluid permeable supports.
17. The collector of claim 16, wherein the lower surface is a material that can support the absorbing surface, the top plate and any load applied to the collector.
18. The collector of claim 16, wherein the top plate is corrugated.

19. The collector of claim 16, wherein the top plate and lower surface are both corrugated.
20. The collector of claim 16 wherein the absorber is a polymer material.
21. The collector of claim 20 wherein the polymer material comprises a fabric.
22. The collector of claim 16, wherein the fluid permeable support comprises a spiral coil.
23. The collector of claim 22 wherein the coil comprises a polymer material.
24. The collector of claim 16, wherein the closure member comprises a channel formed from a polymer material.
25. The collector of claim 16, further including support clips to attach the top plate and lower surface to a support structure to accommodate thermal expansion.
26. The collector of claim 16, wherein the lower surface is an existing planar structure upon which the other components are placed.

27. The collector of claim 16, wherein the lower surface is an existing corrugated structure and upon which the other components are placed to form a new solar collector system including said corrugated structure.
28. The collector as in claim 16 wherein the fluid is air.
29. The collector as in claim 16 wherein the tilt angle of the absorber material is adjustable within the collector.
30. The collector as in claim 29 wherein the tilt angle is adjusted by varying the size of the fluid permeable supports.
31. The collector as in claim 16 further including restraining clips to connect at least portions of an edge of the collector to a support wherein the restraining clips provide vertical restraint but permit horizontal movement.
32. A solar energy collector comprising:
- a corrugated top plate,
 - a corrugated bottom plate,
 - a sheet of transpired material attached tautly between the tops of the corrugations on the bottom plate and the bottoms of the corrugations on the top plate,
 - wherein the transpired sheet supports the top plate and

wherein clips at spaced intervals along the side of the collector hold the top and bottom plates to an underlying support.

33. The collector of claim 32, wherein the transpired material is connected to the top plate.

34. The collector of claim 33, wherein the transpired material is attached only at the ends of the top plate.

35. The collector of claim 34, wherein the transpired material is attached to the corrugations in which the transpired material is in contact.

36. The collector of claim 32, wherein the transpired material is connected to the bottom plate.

37. The collector of claim 36, wherein the transpired material is attached only at the ends of the bottom plate.

38. The collector of claim 37, wherein the transpired material is attached to the corrugations in which the transpired material is in contact.

39. The collector of claim 32, wherein the transpired material is attached with an adhesive.
40. The collector of claim 32, wherein the transpired material is attached with hot-melt glue.
41. The collector of claim 32, wherein the transpired material is attached by spot welding.
42. The collector of claim 32, wherein the transpired material is attached by a mechanical device.
43. The collector of claim 32, wherein the transpired material is attached so that a degree of conforming drape exists between the transpired material and the plate structure to which it is attached.
44. The collector of claim 32, wherein the top plate and bottom plate have different corrugated shapes.
45. The collector of claim 1, wherein the supports are tubular.
46. The collector of claim 1, wherein the supports are angled.
47. The collector of claim 1, wherein the supports are “U” shaped.

48. The collector of claim 1, wherein the supports are ribbed.